and more fertile classes. The divergence in colour traits noticed in Glasgow is in part due to the presence of a considerable non-Scottish element.

Dark traits seem to be associated with imbecility, blindness, and deafness, because these defects are significantly more frequent in Gaelic-speaking districts than in Scotland as a whole. This is perhaps explained, as the author suggests, by the greater emigration of the fittest members of the community from the west than from the rest of the country. The author distinguishes five racial types:—The Scandinavian or Germanic type, with fair hair and blue eyes; the dark European type, with dark hair and dark eyes, which he subdivides into Mediterranean and Danish; the Scoto-Keltic type, with dark hair and blue eyes; the essentially Scotch type, with medium hair and eyes; and the Caledonian type, with red hair. The Scoto-Keltic, Scotch, and Caledonian types are probably crosses, while the Danish type may probably on further investigation be shown to have affinities to the Alpine race.

After showing that the pigmentation in Scotland is intermediate between that of northern and southern Europe, Tocher adds that even in southern Germany the hair is lighter than in Scotland. This will seem inconceivable to those who have worked in the two countries, while the figures quoted in support of this statement suggest the existence of some misconception of the limits of the terms fair and dark as used by different observers. The author has compared his results with those of Fürst in Sweden and Ammon in Baden, using the headings Fair, Red, Medium, and Dark as equivalent to Blond, Roth, Braun, and Schwarz, regarding Medium as Braun. The Continental use of the term Schwarz is practically identical with Black as used by Beddoe, who differs from Tocher in including therein the very darkest browns, only recognisable as browns in a very good light. This in a large measure accounts for the low proportion of dark hair attributed to Sweden. A further difficulty has arisen in comparing the Swedish Blond with the Scotch Fair. The "Blond" class was constructed by Fürst out of a combination of two others, "Gelb" and "Cendré." While the lighter members of the latter class might be included in the Fair division of Tocher, the darker members overstep the upper limits of his Medium division. Fürst, in his monograph on Swedish hair and eye colour, contrasting his results with those obtained by Sören Hansen and Westergaard from Danish children, compares his Braun class with the Dunkel class of the latter authors, and his Blond with their Hell and Mittel classes combined. Sören Hansen's divisions, Roth, Hell, Mittel, Dunkel, and Schwarz, are practically identical with those of Tocher.

When Blond—that is, Gelb+Cendré or Hell+Mittel—is regarded as equivalent to Fair, Braun to Medium, and Schwarz to Dark+Black, the Scottish results naturally show a different distribution from that obtaining in the rest of Europe.

The real comparative tables give the percentage distribution of hair colours as:—

Sweden (adult males)		Denmark (children)		Scotland (boys)		Baden (adult males)	
Gelb ...	23·3	Hell ...	41·8	Fair ..	24·9	Blond ...	41·6
Cendré...	52·0	Mittel ...	40·9	Medium .	43·3	Braun ...	38·7
Braun ...	21·6	Dunkel...	13·0	Dark ...	25·0	Schwarz .	18·0
Schwarz .	0·8	Schwarz .	1·4	Jet-black.	1·2	Roth ...	1·7
Roth ...	2·3	Roth ..	2·9	Red ...	5·5		

The distribution in Scotland, then, agrees with that of Europe, and falls into position between Sweden and south Germany. The fact that the data cannot be directly compared points out the urgent need for an international nomenclature, or at least for international standards and authorised translations.

One of the most interesting features of the present survey is that it tends to show that the population of Scotland might have been derived from original blond and brunet elements in approximately equal proportions which are gradually blending to form a distinctive Scottish type.

Further details and correlations are promised by the author for some subsequent publication, and will be anxiously awaited, since, for completeness of detail and thoroughness of statistical investigation, the present memoir is unequalled. It is to be hoped now that the chance exists that the results of a similar survey may in time be available for England and Wales.

THE NEW WIRELESS TELEGRAPH STATION.

AS mentioned in our notes columns of December 17, the new wireless telegraph station at Bolt Head, South Devon, was opened by the Postmaster-General on December 11. This station is the first belonging to the Post Office to be opened for a regular service of communication with ships at sea, and has telegraphic connection with Exeter, through which town all messages will be transmitted. In accordance with the provision of the International Radio-telegraphic Convention of 1906, the station will establish public communication with all vessels carrying wireless telegraphic apparatus irrespective of the system of wireless telegraphy which they may have installed. The range of the station is 250 miles, though it is not anticipated that the general working range required will exceed about 100 miles. The cost of communication is expected to average about 8*d.* per word, made up of a shore charge of 3½*d.* and a ship charge of 4*d.*, and the usual ½*d.* per word for the ordinary land rate.

The station is fitted with apparatus on the Marconi system. The aërial, which is 160 feet high, consists of two central conductors and four arms radiating to small poles placed around the main mast, thus being of what is now known as the "Umbrella" type. Power is obtained from a 3-kw. alternator supplying current at 100 volts 50 cycles, which is transformed up to 15,000 to 20,000 volts. The alternator is coupled to a direct-current machine, which can be run either as a motor, or as a generator driven by an 8-h.p. oil engine when it is required to charge the cells, in which case current can at the same time be taken from the alternator. The battery is also used for the lighting of the building. The signalling is effected by a key in the generator circuit which controls a magnetic key which only allows the alternator circuit to be open when the current is at zero, as is now usual with wireless telegraphic work where the power is supplied by an alternator in order to avoid sparking at the contacts of the signalling key. The sparking gap is of the standard Marconi type, and can be varied in length from 2 mm. to 8 mm.; it is completely enclosed in order to deaden the noise of the sparking.

The receiving apparatus consists of a Marconi magnetic receiver, which gives telephonic signals in the usual way, and a coherer circuit for calling up, which is disconnected when receiving signals on the magnetic receiver. The coherer circuit can also be used in connection with a Morse inker to record messages when the operator is not present.

The normal wave-length is 600 metres, but this can be varied, and apparatus is provided to enable the

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circuits to be tuned accurately in order to obtain the clearest signalling.

Whilst this is the first State-owned station to be used for public purposes, it may be mentioned that the Marconi Company owns eight such stations which have been open for public communication since the Radio-telegraphic Convention came into force. It will be recollected that the Marconi Company somewhat strongly opposed this convention before ratification on the ground that it would destroy the business which they had built up, an opposition which, as we pointed out in Nature at the time, appeared to be short-sighted and against the public interest. It is gratifying to learn that the company has loyally accepted the convention, and has steadily cooperated with the Post Office in carrying out its provisions, with what are stated to be beneficial results both for the company and the public, the traffic dealt with having increased in volume and the ships carrying Marconi apparatus having increased in number. Everyone will welcome this further evidence of the development of the utility of wireless telegraphy.

M. S.

SWEDISH HYDROGRAPHICAL AND FISHERY INVESTIGATIONS.[1]

ALTHOUGH it did not need the existence of an International Council to point out the field for physical and biological research offered by the waters of the Baltic, there is no doubt that during the last few years of cooperative investigation great strides have been made in our knowledge of the hydrographical and correlated biological conditions of this sea, which presents phenomena of peculiar interest which do not exist in the case of the more economically important North Sea.

The third volume of the "Svenska Hydrografisk Biologiska Kommissionens Skrifter" contains the results of the investigations made by the Swedish men of science Pettersson, Trybom, Schneider, and Broch, up to the end of 1907.

The first-named describes and discusses at some length the results of his observations upon the water-circulation between the ocean and the Baltic, for the proper understanding of which it is necessary to measure the force of the in- and outgoing currents at the entrances to this sea. This the author has carried out by the use of his "Universalsinstrument," an apparatus designed to indicate the direction and velocity of the current, and, at the same time, to take plankton and water samples at a particular depth. The chief determinations were made at stations in the Great Belt at depths of 5, 10, 20, and 30 metres. In general, the water circulation in this channel consists of an outflowing surface current of low salinity and an undercurrent of high salinity entering from the Kattegat, with an intermediate layer of "mixed" water. Pettersson's work has shown in definite terms the various degrees to which these different layers are affected by the influence of daily tidal movements and also by the annual oscillation of Atlantic water—the Gulf Stream flood—and his chief result is to demonstrate that these oceanic factors are of far greater importance in their effect upon the water circulation of the Baltic than had hitherto been suspected from surface observations. In general, the water-layers at 10 m. and 20 m. depth move in opposite directions, except at the time of strongest ebb-tide, when the whole of the water moves seaward. For example, a series of observations at a station in the Great Belt give during flood-tide at 10 m. depth an average velocity of 8.0 cm. per second from south to north, and at 20 m. depth an average velocity of 27.6 cm. per second from north to south; during the ebb-tide an average velocity of 69.2 cm. per second, and at 20 m. of 9.7 cm. per second, both the latter being from south to north. The boundaries between water-layers of certain salinity are not horizontal, but the masses are wedge-shaped and are much closer together in the Kattegat than in the inner sea. The surface movements of the Baltic do not depend so much upon the influence of fresh-water supplies from the rivers, but are the results of forces set up by the intrusion below of ocean water of greater density, the effect of which is to cause a circulation of water from the lower layers to the surface. The interesting circumstance that the dissolved oxygen in the surface water is of distinctly greater amount in the inner (northern) Baltic than nearer the southern entrances is explained by reference to the fact that the southern water has a longer course as an undercurrent than is the case in the northern Baltic. The Little Belt was found to consist of "mixed" water practically homogeneous in temperature and salinity, the flood-tide passing the channel with almost equal velocity at all depths, while the ebb is swiftest at the surface. The Sound showed only one outflowing current of homogeneous Baltic water.

It is in their relation to hydrographical conditions that Dr. Schneider's observations on the distribution of pelagic eggs and larvæ of the food-fishes are of special interest. Under the particular physical conditions which prevail in the Baltic, the *vertical distribution* of these forms is characteristic. Pelagic teleostean ova were taken at considerable depths and were practically absent at the surface. Variation in depth distribution was shown for different species, and the same species was found at different depths in different months, while larvæ occurred, on the whole, nearer to the surface than the ova. The possibility of the existence of cod-larvæ in the northern waters of the Baltic is proved by new positive evidence of their occurrence, though in no great numbers, and a previously accepted theory that they only immigrate at a later stage is corrected. On the other hand, while it has been stated that the plaice stock of the Baltic is self-contained and needs no replenishing from other seas, the writer especially notes the absence of plaice larvæ from the catches of the Swedish expeditions, but draws no conclusion from this negative evidence, and leaves open the question as to whether, and at what stage, there is an immigration of plaice fry from the west.

Trybom contributes additions to the record of experiments with marked flat-fish and lobsters, and in collaboration with Schneider describes experiments with marked eels which have given interesting results. The eels showed practically without exception an oceanward tendency in their migration, moving in a southerly and westerly direction along the Swedish coast and through the Sound. The high rate of 104 km. travelled in two days was shown by one fish, and ten out of the 63 re-captured, from a total of 300 liberated, travelled at an average rate of more than 20 km. per day. Incidentally, these experiments tend to prove the assertion of fishermen that bright moonlight is unfavourable to the capture of eels.

The result of a long series of observations made by Trybom in the river Dalelf upon the piscine enemies of salmon and trout ova is to brand the grayling as by far the most guilty of spawn-devourers. Small trout prey upon the ova of their own and other species of Salmonidæ, and Coregonus, particularly when "spent," is destructive to its own spawn, though seldom found with salmon or trout eggs in its

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[1] "Svenska Hydrografisk Biologiska Kommissionens Skrifter III." (Göteborg: Wald. Zachrissons Boktryckeri A.-B., 1908.)

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